

02-17-06

gjc

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Issued Patent No. : 6,828,323  
 Issue Date : December 7, 2004  
 Appl. No. : 09/777,727  
 Filing Date: : February 5, 2001  
 TC/A.U. : 1624  
 Examiner : Hong Liu  
 Applicant : Platz et al.  
 For : Isoalloxazine Derivatives to Neutralize Biological  
 Contaminants  
 Docket No. : 66-99A  
 Customer No. : 23713



**Certificate**  
**FEB 23 2006**  
**of Correction**

Commissioner for Patents  
 Attention: Certificate of Corrections Branch  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

CERTIFICATE OF MAILING	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage for <b>Express Mail</b> in an envelope addressed to:	
Commissioner for Patents, Attention: Certificate of Corrections Branch PO Box 1450, Alexandria, VA 22313-1450	
February 16, 2006 Date	<i>Cathy Nelson</i> Cathy Nelson
EV 758 237 897 US Express Mail Tracking Number	

**REQUEST FOR CERTIFICATE OF CORRECTION**  
**UNDER 37 C.F.R. 1.322**

Sir:

Please issue a Certificate of Correction for U. S. Patent 6,828,323, as errors appear in the printed patent. Enclosed are two copies of Form PTO/SB/44 with the errors listed thereon. Also enclosed are copies of the specification pages referred to herein.

The printing errors appeared correctly in the application, as shown by the enclosed copies of the specification pages as originally filed. Specifically, the error in column 8, lines 23-30, third structure, appears correctly on page 12 of the application as originally filed.

FEB 23 2006

FEB 23 2006

The error in column 9, lines 3-10, first structure, appears correctly on page 13, first structure, of the application as originally filed.


The errors in column 12, lines 14, 15 and 17, appear correctly on page 18, lines 14-15 of the application as originally filed.

The error in column 22, line 24, appears correctly on page 35, line 3 of the application as originally filed.

The error in column 27, claim 13, line 18 appeared correctly in the Response to Office Action filed November 25, 2003.

It is believed that the present submission does not require the payment of any fees. If this is incorrect however, please charge any required fee to Deposit Account No. 07-1969.

Respectfully submitted,



Susan K. Doughty  
Reg. No. 43,595

**GREENLEE, WINNER AND SULLIVAN, P.C.**  
4875 Pearl East Circle, Suite 200  
Boulder, CO 80301  
Telephone: (303) 499-8080  
Facsimile: (303) 499-8089  
E-mail: [winner@greenwin.com](mailto:winner@greenwin.com)  
Attorney Docket No. 66-99A  
February 16, 2006

## UNITED STATES PATENT AND TRADEMARK OFFICE

**CERTIFICATE OF CORRECTION**

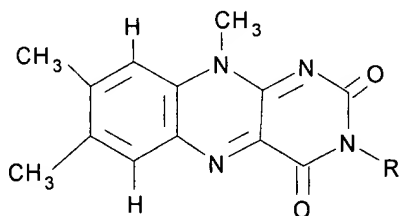
Page 1 of 2

PATENT NO. : **6,828,323 B2**  
 APPLICATION NO. : **09/777,727**  
 ISSUE DATE : **December 7, 2004**  
 INVENTOR(S) : **Platz et al.**

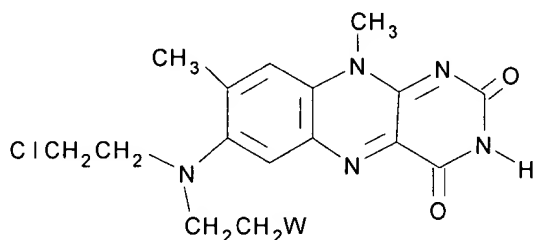
It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification:

Column 8, lines 23-30, third structure, replace the third structure with --



Column 9, lines 3-10, first structure, replace the first structure with --



Column 12, line 14, replace "OR<sub>C</sub>, SR<sub>C</sub>, NR<sub>C</sub>R<sub>f</sub>," with --OR<sub>e</sub>, SR<sub>e</sub>, NR<sub>e</sub>R<sub>f</sub>--.

Column 12, line 15, replace "CONR<sub>C</sub>R<sub>f</sub>, where R<sub>C</sub>" with --CONR<sub>e</sub>R<sub>f</sub>, where R<sub>e</sub> --.

Column 12, line 17, replace "OR<sub>C</sub>, and SR<sub>C</sub> where R<sub>C</sub> " with --OR<sub>e</sub>, and SR<sub>e</sub> where R<sub>e</sub> --.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

GREENLEE, WINNER AND SULLIVAN, P.C.  
 4875 Pearl East Circle, Suite 200  
 Boulder, CO 80301  
 Phone: (303) 499-8080  
 Fax: (303) 499-8089  
 email: winner@greenwin.com

FEB 27 2005

## UNITED STATES PATENT AND TRADEMARK OFFICE

**CERTIFICATE OF CORRECTION**

Page 2 of 2

PATENT NO. : 6,828,323 B2  
APPLICATION NO. : 09/777,727  
ISSUE DATE : December 7, 2004  
INVENTOR(S) : Platz et al.

Column 22, line 24, replace "from" with --form--.

In the Claims:

Column 27, Claim 13, line 18, replace "to the" with --to the compound--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

GREENLEE, WINNER AND SULLIVAN, P.C.  
4875 Pearl East Circle, Suite 200  
Boulder, CO 80301  
Phone: (303) 499-8080  
Fax: (303) 499-8089  
email: winner@greenwin.com

**FEB 27 2006**

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

Page 1 of 2

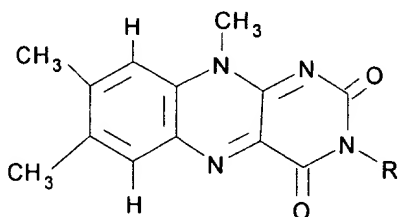
COPY

PATENT NO. : 6,828,323 B2  
 APPLICATION NO. : 09/777,727  
 ISSUE DATE : December 7, 2004  
 INVENTOR(S) : Platz et al.

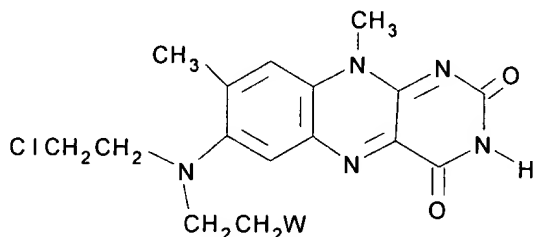
It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification:

Column 8, lines 23-30, third structure, replace the third structure with --



Column 9, lines 3-10, first structure, replace the first structure with --



Column 12, line 14, replace "OR<sub>C</sub>, SR<sub>C</sub>, NR<sub>C</sub>R<sub>f</sub>," with --OR<sub>e</sub>, SR<sub>e</sub>, NR<sub>e</sub>R<sub>f</sub> --.

Column 12, line 15, replace "CONR<sub>C</sub>R<sub>f</sub>, where R<sub>C</sub>" with --CONR<sub>e</sub>R<sub>f</sub>, where R<sub>e</sub> --.

Column 12, line 17, replace "OR<sub>C</sub>, and SR<sub>C</sub> where R<sub>C</sub> " with --OR<sub>e</sub>, and SR<sub>e</sub> where R<sub>e</sub> --.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

GREENLEE, WINNER AND SULLIVAN, P.C.  
 4875 Pearl East Circle, Suite 200  
 Boulder, CO 80301  
 Phone: (303) 499-8080  
 Fax: (303) 499-8089  
 email: winner@greenwin.com

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

Page 2 of 2

COPY

PATENT NO. : 6,828,323 B2  
APPLICATION NO. : 09/777,727  
ISSUE DATE : December 7, 2004  
INVENTOR(S) : Platz et al.

Column 22, line 24, replace "from" with --form--.

In the Claims:

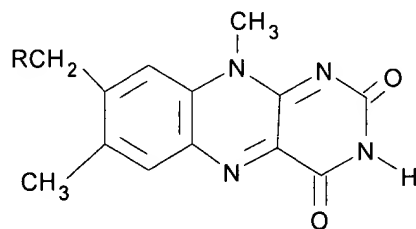
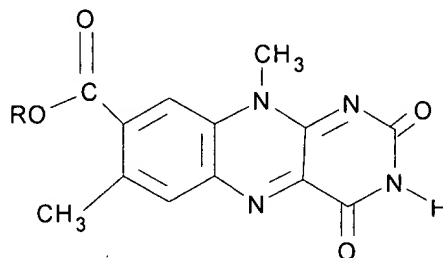
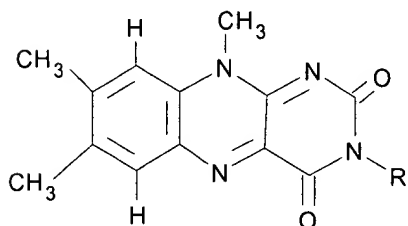
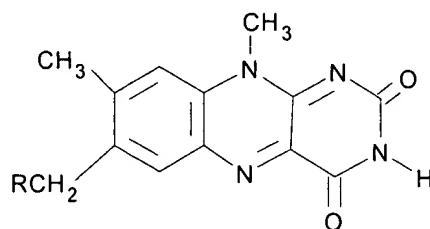
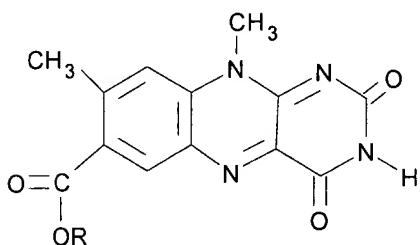
Column 27, Claim 13, line 18, replace "to the" with --to the compound--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

GREENLEE, WINNER AND SULLIVAN, P.C.  
4875 Pearl East Circle, Suite 200  
Boulder, CO 80301  
Phone: (303) 499-8080  
Fax: (303) 499-8089  
email: winner@greenwin.com

substantially interfere with the desired microorganism neutralization of the microorganism neutralizer, as may readily be determined without undue experimentation by those skilled in the art.

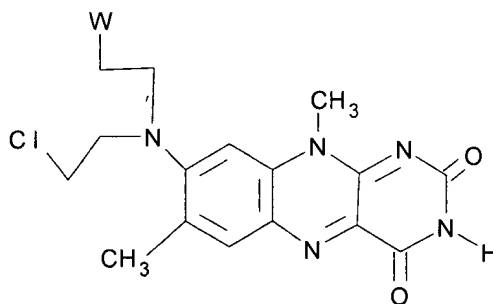
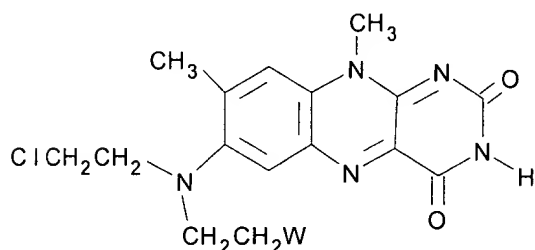
5 The invention provides a class of compounds wherein a plurality of R1, R2, R3, R4, R5 and R6 are neither CH<sub>3</sub> nor H; and a class of compounds wherein one of R1, R2, R3, R4, R5 and R6 is neither CH<sub>3</sub> nor H. Particular embodiments of compounds of those classes include those wherein a R1, R2, R3, R4, R5 or R6 which is neither CH<sub>3</sub> nor H imparts substantial water solubility to the microorganism neutralizer. Preferred examples of these compounds are:



wherein R is a substituent imparting water solubility to the molecule, including, but not limited to, ascorbate, alcohol, polyalcohol; amine or polyamines, straight chain or cyclic saccharides, sulfates, phosphates, alkyl chains optionally substituted with -OH at any position, glycols, including polyethylene glycol and polyethers.

- 5 Another class of compounds of the invention include those wherein a R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> or R<sub>6</sub> that is neither H nor CH<sub>3</sub> contains a halogen or is a halogen, wherein the halogen is selected from the group consisting of fluorine, chlorine, bromine and iodine. Particular embodiments of compounds of this class include compounds where a R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> or R<sub>6</sub> that is neither H nor CH<sub>3</sub> is: -NR<sup>a</sup>-(CR<sup>b</sup>R<sup>c</sup>)<sub>n</sub>-X wherein X is a halogen selected from the group  
10 consisting of chlorine, bromine and iodine, or is a water soluble group, R<sup>a</sup>, R<sup>b</sup> and R<sup>c</sup> are, independently of each other, selected from the group consisting of hydrogen and optionally substituted hydrocarbyl, and n is an integer from 0 to 20.

Preferred examples of compounds of this class are:



- 15 where W is a substituent imparting water solubility to the molecule, including, but not limited to, ascorbate, alcohol, polyalcohol; amine or polyamines, straight chain or cyclic saccharides, sulfates, phosphates, alkyl chains optionally substituted with -OH at any position, glycols, including polyethylene glycol and polyethers.



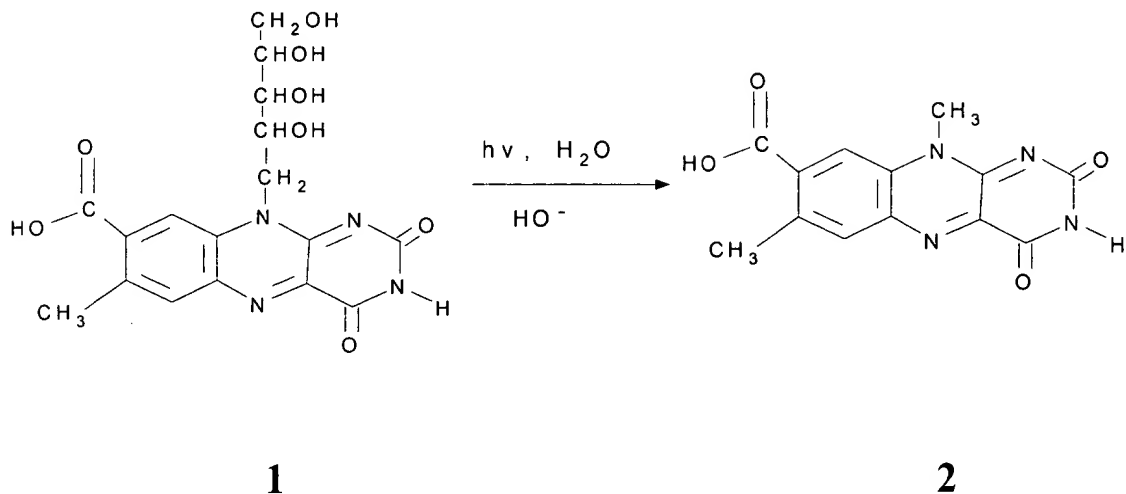
group substituted with a heterocyclic aromatic ring. The aromatic rings in the heterocyclic biaryl group can be optionally substituted.

"Biaryl" refers to carbocyclic aryl groups in which a phenyl group is substituted by a carbocyclic aryl group ortho, meta or para to the point of attachment of the phenyl ring to the decalin or cyclohexane. Biaryl groups include among others a first phenyl group substituted with a second phenyl ring ortho, meta or para to the point of attachment of the first phenyl ring to the decalin or cyclohexane structure. Para substitution is preferred. The aromatic rings in the biaryl group can be optionally substituted.

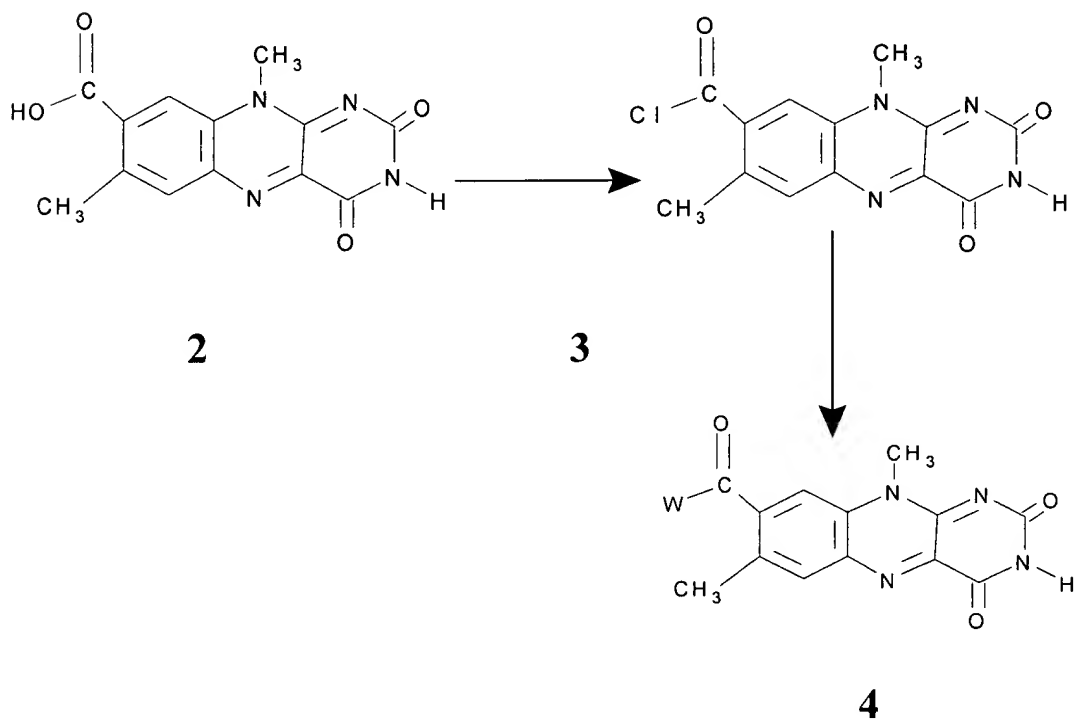
Aryl group substitution includes substitutions by non-aryl groups (excluding H) at one or more carbons or where possible at one or more heteroatoms in aromatic rings in the aryl group. Unsubstituted aryl, in contrast, refers to aryl groups in which the aromatic ring carbons are all substituted with H, e.g. unsubstituted phenyl ( $-C_6H_5$ ), or naphthyl ( $-C_{10}H_7$ ). Suitable substituents for aryl groups include among others, alkyl groups, unsaturated alkyl groups, halogens, OH, SH,  $NH_2$ , COH,  $CO_2H$ ,  $OR_e$ ,  $SR_e$ ,  $NR_eR_f$ ,  $CONR_eR_f$ , where  $R_e$  and  $R_f$  independently are alkyl, unsaturated alkyl or aryl groups. Preferred substituents are OH, SH,  $OR_e$ , and  $SR_e$  where  $R_e$  is a lower alkyl, i.e., an alkyl group having from 1 to about 3 carbon atoms. Other preferred substituents are halogens, more preferably chlorine or bromine, and lower alkyl and unsaturated lower alkyl groups having from 1 to about 3 carbon atoms. Substituents include bridging groups between aromatic rings in the aryl group, such as  $-CO_2-$ ,  $-CO-$ ,  $-O-$ ,  $-S-$ ,  $-P-$ ,  $-NH-$ ,  $-CH=CH-$  and  $-(CH_2)_\ell-$  where  $\ell$  is an integer from 1 to about 5, and particularly  $-CH_2-$ . Examples of aryl groups having bridging substituents include phenylbenzoate. Substituents also include moieties, such as  $-(CH_2)_\ell-$ ,  $-O-(CH_2)_\ell-$  or  $-OCO-(CH_2)_\ell-$ , where  $\ell$  is an integer from about 2 to 7, as appropriate for the moiety, which bridge two ring atoms in a single aromatic ring as, for example, in a 1, 2, 3, 4-tetrahydronaphthalene group. Alkyl and unsaturated alkyl substituents of aryl groups can in turn optionally be substituted as described *supra* for substituted alkyl and unsaturated alkyl groups.

## Synthesis

Carboxyriboflavin (1, McCormick, D. (1970) J. Heter. Chem. 7:447) is photolyzed in aqueous alkali to form a carboxylumiflavine (2).



5 Compound 2 is converted to an acid chloride 3 with oxalylchloride.





IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 09/777,727 Confirmation No. 6079  
Applicant : Platz et al.  
Filed : February 5, 2001  
TC/A.U. : 1624  
Examiner : Liu, Hong  
For : ISOALLOXAZINE DERIVATIVES TO  
NEUTRALIZE BIOLOGICAL CONTAMINANTS  
Docket No. : 66-99A  
Customer No.: 23713

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited  
with the United States Postal Service with sufficient postage  
as Express Mail in an envelope addressed to:  
Commissioner for Patents, Washington, D.C., 20231

November 25, 2003  
Date

*Cathy Nelson*  
Cathy Nelson

EV 412172587 US  
Express Mail Tracking Number

RESPONSE TO OFFICE ACTION

Sir:

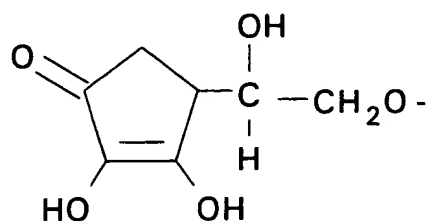
In response to the Office Action mailed May 29, 2003, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 26 of this paper.

photosensitizer, one of R1, R2, R3, R4, R5 and R6 is neither CH<sub>3</sub> nor H.

50. (currently amended) The compound composition of claim 49, wherein in the photosensitizer, the R1, R2, R3, R4, R5 and R6 that is neither CH<sub>3</sub> nor H imparts substantial water solubility to the compound.
51. (currently amended) The compound composition of claim 50, wherein in the photosensitizer, the R1, R2, R3, R4, R5 and R6 that imparts substantial water solubility to the compound is selected from the group consisting of: straight chain or cyclic saccharides having 5 or 6 carbon atoms; -OH; -NH<sub>2</sub>; -SO<sub>4</sub>; -PO<sub>4</sub>;



and alkyl, alkenyl, alkynyl or aryl groups containing one or more members selected from the group consisting of: -OH, -O-, -S-, -NH<sub>2</sub>, -SO<sub>4</sub>, and -PO<sub>4</sub>.

52. (currently amended) The compound composition of claim 51, wherein in the photosensitizer, R2, R3, R4, R5 or R6 is neither H nor CH<sub>3</sub>.
53. (currently amended) The compound composition of claim 51, wherein in the photosensitizer, R3 and R6 are H.
54. (currently amended) The compound composition of claim 49, wherein in the